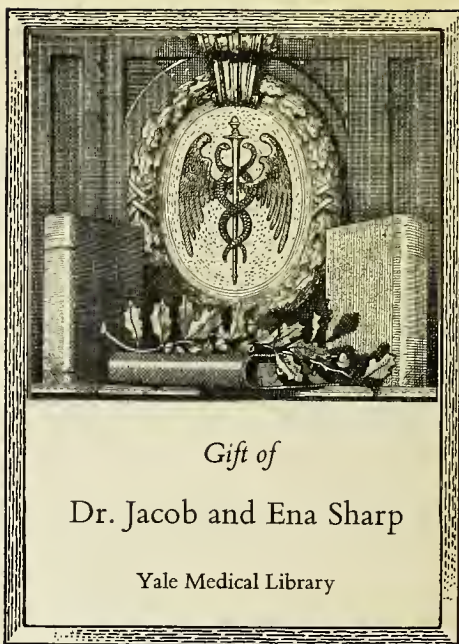


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EDUCATIONAL LECTURES
ON
DENTAL and ORAL HYGIENE

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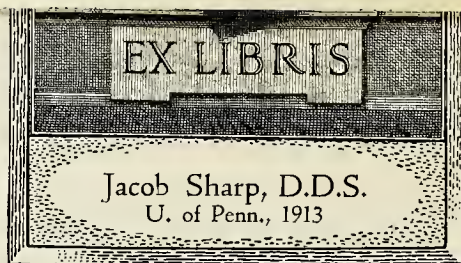
T. C. TRIGGER, D. D. S.



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EDUCATIONAL

Lectures on Dental and Oral Hygiene

EDITED BY

DR. T. C. TRIGGER

LICENTIATE OF THE ROYAL COLLEGE OF DENTAL SURGEONS OF
ONTARIO, CANADA



GODDESS APPOLONIA
THE PATRON SAINT OF DENTISTRY

ILLUSTRATED

ST. THOMAS
THE JOURNAL PRESS
1912

TO THE PUBLIC

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THE object in presenting these series of Lectures on Dental and Oral Hygiene to the public is to create a greater interest for the care and preservation of the teeth, and also to show the intimate relation they bear to the health, beauty and comfort of the individual.

The advances made during recent years in the prevention of diseases have been incalculable, and those diseases which were so destructive to human life have been greatly ameliorated through scientific treatment—by proper sanitary and hygienic measures.

It is earnestly desired that these pages may be of some value to the reader, and pre-eminently helpful towards the care of the teeth and oral cavity, and thus aid in the present world-wide campaign of prophylactic effort for their protection, education and advancement.

THEODORE CLARK TRIGGER.

St. Thomas, Ontario, Canada

November 1st, 1911

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SANITARY DRINKING FOUNTAIN

The "Kiss of Life" which has replaced the old "Cup of Death"

EDUCATIONAL LECTURES ON DENTAL AND ORAL HYGIENE

BY T. C. TRIGGER, L. D. S., D. D. S.

"It is infinitely a higher aim to prevent disease than cure it."

IT has frequently been impressed upon the Dental Profession that the public have not been properly educated on the importance of the care of the teeth and the mouth as a vital factor in the preservation of the health, but it is gratifying to state that a number of Educators have been recently aroused to vigorous action, by advocating prophylactic measures for the public good.

As a result of this action, the public is beginning to awaken to the fact that greater attention should be given to the hygiene of the teeth and mouth, which have an important bearing upon the general health. The public have not recognized their importance in the digestive process, nor have they fully realized the disastrous results upon the whole gastro-intestinal tract, through the development of micro-organisms causing disease, brought about by improper mastication, as the result of defective teeth, and the unclean condition of the mouth. The public have also overlooked the importance of the proper development of the teeth and bones of the face in the esthetic features, as well as in the regulating and purifying the air supply to the lungs, *one* of the factors in preventing the worst scourge of the human race, generally known as the White Plague or tuberculosis. Specialists of nose, throat, stomach and lung diseases attach great importance to the condition of the oral cavity in determining the cause and treatment of these ailments.

It is good to conserve forests, lands and water utilities, but it is far more important and more fundamental to conserve human life, and thus develop a nation strong and vigorous.

In Canada and the United States, as well as some of the European countries, large sums have been expended to conserve the material resources, but little has been appropriated for the preservation of human life, and when such steps are taken by the authorities, the public will realize that the wealth of a country does not consist so much in material resources, as in the health of the people.

When sanitary and hygienic conditions are better understood by the public, eventually there will be a decided decrease of mortality as the result.

Colonel Roosevelt, former President of the United States, in an address before the American Public Health Association on health conservation, said: "It is the prime requisite of every nation to have every man and woman an effective unit. Men cannot be effective, they cannot be good, unless they are healthy. You public health men are dealing with the basic problem of citizenship. Like other men in public affairs, I am awake to the needs of the public health. It is necessary to join our efforts for the preservation of public health. It is important to keep not only the health of the individual, but also to keep the health of the nation."

The value of Oral Hygiene to the health of the body has for some time been recognized by the leading military countries of the world, and the appointment of Dental Surgeons to give their services to the troops in time of war as well as in time of peace, has been of incalculable benefit. The British Government, during the recent hostilities in South Africa, learned a valuable lesson, that the Dental Surgeon was very necessary in retaining the health of the troops, as records from the Military Department show that many of the men became sick or were invalided home on account of dental maladies.

The War Department of the United States has already an efficient Dental Corps attached to the Militia.

The necessity of public education in the care of the teeth is apparent, when it has been proven by inspection of public school children, in some of the schools in Canada, United States, Great Britain, Germany and other countries, that fully eighty per cent. of the children have dental diseases or diseases brought about by impaired development.

The report of the inspections came with great surprise, not only to the Dental Profession, but to those educators and parents who are interested in the education and physical development of their children. As a result of the investigations, school boards all over the country have taken up the matter and have given it consideration, regular and systematic examinations have been conducted, especially in the larger schools of the cities, free dispensaries have been opened and equipped, with gratuitous services of the dental practitioners, supported by gifts from public-spirited citizens and communities.

A notable example of philanthropy is the endowment of one million dollars to the great city of Boston, for the maintenance of a dental institution, known as the Forsyth Dental

Infirmary for Children, which will be devoted to the care of the teeth of all deserving children under the age of sixteen. This munificent gift for the erection of such a building came from the Forsyth Brothers, industrial men of Boston.

In Germany a like amount has been given by a member of the Rothschild family for the purpose of erecting a similarly equipped building, having attendants and dentists to carry out the good work among the poor.

It seems that the only rational way to educate the children on the care of the teeth is through the medium of the public schools, by giving more stress on oral hygiene in the course of studies, and the appointment of competent examiners to carry out a systematic inspection, from time to time to report the conditions to the school authorities and likewise to the parents, so that the school and the home in these matters will be more closely linked together.

In some of the cities and districts in America and Europe, Dental Inspectors have been appointed, who are giving beneficial services to the public; the New York State Board of Health, through their energetic and capable Commissioner, has made an appointment of two dental consultants and lecturers on Oral Hygiene.

During the Fifteenth Annual Session of the National Dental Convention, held in Cleveland, there was organized by prominent Dentists and Educators a National Mouth Hygiene Association, the object of which is to allow an opportunity for members of all professions and others to become interested in the hygiene movement.

THE TEETH.

The teeth are the hardest and most indestructible of any organ of the human body. We are omnivorous creatures and our teeth are so constructed that we are able to eat a mixed diet, both animal and vegetable substances. The incisors and molars represent those teeth which are capable of cutting into and then grinding vegetable matter, while the cuspids and bicuspid are intended for holding fast to and cutting animal food, that the digestive fluids may reach it more freely. The chief functions of the teeth are for chewing the food, to aid in articulation of words, and to give beauty and expression to the face.

On account of the teeth being composed of such hard materials and almost unaffected by exposure to the atmos-

phere, they have been in numerous instances about the only clue left in identifying the remains of victims of foul play or of accidental death.



DENTAL IDENTIFICATION

We are endowed with two distinct sets of teeth—one, which serves the purpose from infancy to childhood, known as the temporary or milk teeth, and the other set, which serves us from childhood to old age, known as the permanent set.

STRUCTURE OF THE TEETH.

A tooth is composed of four constituents, namely:

1. Enamel.
2. Dentin.
3. Cementum.
4. Pulp.

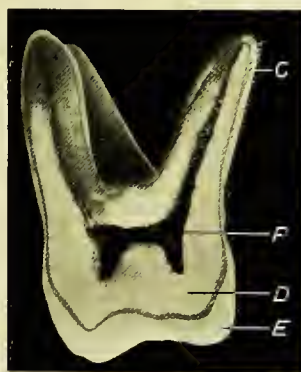
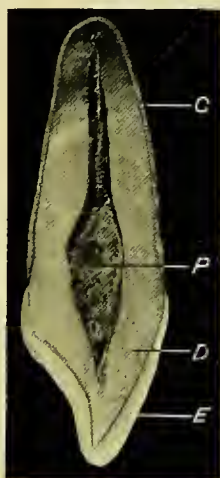
There is, however, another tissue which really forms a part of the tooth structure, and that is a very thin covering around the roots, which is identical to the covering around the bones. When inflammation sets in around the tooth, this tissue becomes very sore and painful and causes the tooth to feel much longer than the rest and sensitive to the touch.

The enamel is that part of tissue which completely forms a cap to the crown of a tooth; it is very hard and flinty, and contains but two per cent. of organic matter. The enamel is thickest on the grinding surface of the tooth, and gradually becomes thinner as it approaches the gum.

The Dentin forms the central and the largest part of the hard tissue of the tooth, completely investing the pulp; over its external surface the enamel is formed, while the root portion is encased by the cementum. The dentin is a whitish or yellowish-white in color, dense and highly sensitive.

The Cementum is the external part of the root of the tooth; this tissue begins at the neck of the tooth or near the margin of the gum in a thin layer and gradually increases in thickness towards the end of the root. This tissue resembles bone very much, and is liable to similar diseases of that structure.

The Pulp is a mass of delicate tissue largely composed of blood vessels and nerve fibres, from which the tooth receives its nourishment, and not wholly made up of nerve tissue as popularly understood. The nerve of the pulp on exposure, or being affected from constitutional troubles from within, may cause excruciating pain.



Cross-section of an incisor tooth of an adult (enlarged). E—Enamel. D—Dentin. P—Pulp (composed of blood vessels and nerves) C—Cementum.

Cross-section of a molar tooth (enlarged). P—Pulp chamber and root canals.

A normal tooth, whether it is an incisor, bicuspid or molar, presents certain characteristics which are common to the teeth of man, and any of these will serve the purpose of describing the divisions of the teeth.

The *crown* is that part of the tooth which is visible within the mouth.

The *cervix*, or the narrowest part, and sometimes called the neck of the tooth, is that near the gum margin where the enamel and the cementum meet.

The *root* is that part which is imbedded in the bony structure of the jaw.

The *apex* is the most extreme end of the root, that is the part farthest removed from the cutting edge of the tooth.

The *pulp chamber* is a cavity situated within the crown of the tooth, containing the largest part of the nerve and blood vessels which supply life and nourishment to the teeth.

The *root-canals* are narrow openings within the roots extending from the pulp chamber to the most extreme end of the root; the small opening at the end of the root, almost indiscernible, where the nerves and vessels enter the tooth is called the *apical foramen*.

To designate the surfaces of the teeth they are known by the position they occupy in the mouth; the anterior surface of the incisor teeth is known as the *labial*, as the lip covers and protects that surface; the inner portion of the same is named the *lingual* surface, being that part of the set which the tongue rests against. The external surface of the bicuspid and molars protected by the cheek is known as the *buccal*, being named after a muscle which forms a large part of the cheek; the internal surface of the same is termed the *lingual*, as on either side of the set the tongue rests against them; the extreme surface of the anterior teeth is called the *incisal* or cutting edge of the tooth; while the similar surface of the posterior teeth is called the *morsal* or grinding portion.

When the superior and inferior sets of teeth are locked together, the teeth are said to be in *occlusion*.

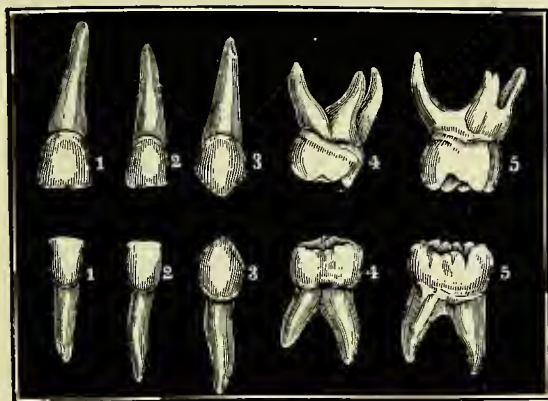
THE TEMPORARY TEETH.

At birth the germs of the temporary or milk teeth are situated within the bony structure of the jaw, as well as the germs of the permanent set, and as the infant develops into childhood, these germs grow to full-sized teeth. The temporary teeth, are, however, all considerably smaller and much whiter in color.

The temporary teeth are known by the following names:

1. Central. 2 Incisors.
2. Lateral. 2 Laterals.
3. Cuspid (Eye Tooth). . . 2 Cuspid.
4. First Molar. 2 First Molars.
5. Second Molars. 2 Second Molars.

There are ten teeth in the upper jaw and ten in the lower, or twenty in all, which make up the temporary set. These figures will the more readily be remembered as being the exact number of the fingers and toes of the child, and, also when it is noticed that an additional tooth appears back of any of these, then it may be accepted as the first of the permanent ones, and right here is where parents are generally misled, and so because of this mistake these "Sixth year molars" are classed with the temporary ones and passed over as of little importance.



—T. BELL

Temporary teeth of the left side of the jaws. 1 and 2—incisors. 3—cuspids. 4 and 5—molars.

The temporary molar teeth are situated just behind the cuspids and it will be observed, occupy the same position as will the bicuspid of the permanent set. As the teeth develop in the jaw bone, and by a natural process are forced through the gum, the crown of the tooth is the first to become fully developed before it makes its appearance, and subsequent to this the root becomes hard and calcified; so it will readily be understood that any injury to the teeth or jaws at this period of development will greatly affect the formation of the teeth.

The time the child's teeth make their appearance is in the following order:

Four Central Incisors.	..From 6th to 8th Month.
Four Lateral Incisors.	...From 7th to 9th Month.
Four First Molars	From 14th to 16th Month.
Four Cuspids	From 16th to 18th Month.
Four Second Molars.. . . .	From 18th to 24th Month.

The lower teeth usually make their appearance a few weeks before the upper ones, and the time they cut through the gum varies, as is indicated by the above table. It is also shown that the whole period of time for the milk teeth to cut through the gums is about two years.



The temporary teeth of a child at six years. 1—Central incisors. 2—Lateral incisors. 3—Cuspids. 4—First molars. 5—Second molars. 6—Permanent molars which are known as the "six-year-old molars."

From the foregoing table it will be observed that the first tooth of the temporary set to erupt is an incisor, while of the permanent set, the first tooth to erupt is the first molar.

Parents should remember particularly the more important facts concerning the eruption of children's teeth, namely the time of the appearance of the two sets, the particular tooth to erupt and the location where these teeth appear.

The temporary teeth usually begin to erupt when the child is about six months of age, and the first tooth to appear is the lower central incisor, which usually precedes the corresponding one of the upper set; then the next teeth to appear are the

lateral incisors which usually erupt between the seventh and ninth months.

It will be noticed just here that there is a characteristic difference between the temporary set and the permanent, namely, that the first or temporary set have no bicuspid, but are substituted by molar teeth; these teeth appear between the ages of fourteen and sixteen months, and are situated just behind the cuspid teeth, four in number, two upper and two in the lower jaw. The cuspid come in mid-way between the incisors and the molars, four teeth back of them and four teeth in front; these teeth, four in number, two upper and two lower, erupt between the ages of sixteen and eighteen months.



—F. B. NOYES

The positions of the temporary and permanent teeth in the jaws at the age of six years

The last teeth to appear are the second molars, four in number, two upper and two lower, and are fully erupted at the end of two years, commencing about the twentieth month.

It will be observed that behind the molars of the temporary set there is a vacant gum surface where there are no teeth, which is for the oncoming of the permanent molar, erupting when the child is about six years of age; and known as the "sixth year molar," and is the sixth tooth in number, in the permanent

set, counting from the central front tooth to the back molars, and also is the sixth tooth in number in the jaw before any of the temporary teeth are shed. These are the first teeth to appear in the permanent sets and are frequently mistaken for temporary teeth. These teeth are four in number, two in the upper and two in the lower jaw. Most parents look for a change to take place in the front of the mouth, instead the change first takes place in the back part.



—F. B. NOYES

The position of the temporary and permanent teeth of a child at the age of six years. Notice the lower permanent central incisors replacing the temporary ones.

The process of development of the teeth is such a natural one as to result in so little disturbance, general or local, that most of them appear before the mother has realized that the teething period has really commenced. While children, with impaired health and not physically strong, have more or less disturbance of the stomach, lungs and skin, the danger attending the cutting of the teeth has, in many cases, been much exaggerated, but with certain physical conditions, as have been stated, it has a real degree of danger to the life of the child.

The nervous system of the child at this time of life is easily affected, and any physical derangement may lead to a general disturbance throughout the whole system, with elevated tem-

perature, diarrhoea, vomiting, coughing, rolling of the eyes, and in some cases convulsions.

The time for the temporary teeth to be shed is when the permanent ones make their appearance, and in no case should these teeth be sacrificed through neglect. The object in keeping the temporary or milk teeth in place is to expand the jaw bones to accommodate the permanent sets.

The teeth of the child should be examined frequently by the family dentist to ascertain their condition; unfortunately a great many parents do not give proper attention to their children's teeth, and do not regard it necessary to have them filled and retained until the permanent ones make their appearance. This is where the mistake is being made by a great many parents, as they postpone a visit to the dentist, allowing their children to suffer agonizing pain and rob them of many nights' sleep. It cannot be too strongly recommended—the importance of filling children's teeth—as it is of great benefit to their health and comfort. If cavities are allowed to form in these teeth, they become filled with foul matter, causing the breath to become very offensive, and as the decays deepen, the nerves of the teeth become exposed, resulting in agonizing pain, loss of necessary sleep and impaired health. The first complaint the little ones give to their parents is that the food is hurting the gums. Now, if this condition exists, the child is not going to cause itself to be hurt, but will allow the food to be bolted, and thus set up a disturbance of the stomach. How frequently has the dentist heard the remark: "Take out the tooth; it is only a first tooth and it don't amount to much." This is a serious mistake, for by removing the teeth at this early stage of life you may affect the development and after arrangement of the permanent teeth. It cannot be impressed too strongly upon the mother that cleanliness is very necessary and a great factor in preserving those little teeth, and the children should be taught as early as possible this very important hygienic measure.

The temporary or milk teeth are seldom characteristically mal-formed, much unlike the permanent ones, which are subjected more to deformities or traces of hereditary tendencies.

THE PERMANENT TEETH.

While the permanent teeth are developing in the jaw, provision is also made by nature to supply us with a second or permanent set, which will serve the economy from childhood to old age. These teeth are developing in the bony structure of

the jaw while the temporary ones are in use, and after the temporary teeth are no longer required the permanent ones make their appearance.

The permanent teeth are thirty-two in number, four central incisors, four lateral incisors, four cuspids, eight bicuspid, eight molars and four wisdom teeth or third molars, so named from developing in mature life.

The following table will show the names of the teeth and time of eruption:

Two Central Incisors appear between the 6th and 8th years.

Two Lateral Incisors appear between the 7th and 8th years.

Two Canine (Eye-teeth) appear between the 11th and 13th years.

Two First Bicuspid appear between the 9th and 10th years.

Two Second Bicuspid appear between the 10th and 11th years.

Two First, or Six-year-old Molars appear between the 5th and 6th years.

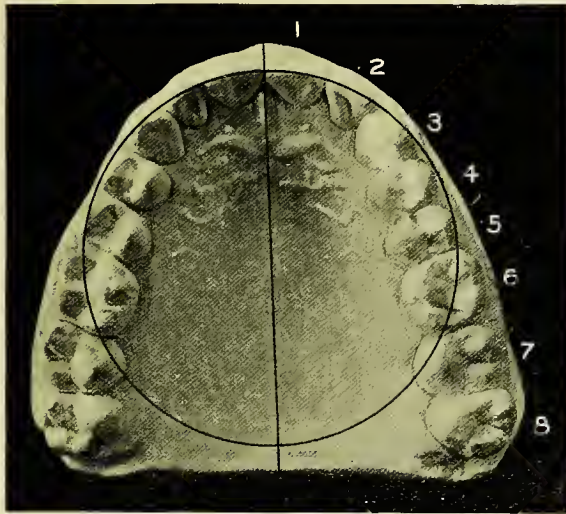
Two Second Molars appear between the 12th and 14th years.

Two Third Molars, or Wisdom Teeth, appear between the 17th and 25th years.

It will be noticed that permanent dentition begins about the sixth year by the eruption of the first molars, which take their position behind the second temporary molars, the growth of the jaw in this situation having made it possible, for nature has wonderfully made provision of an harmonious growth of the bone to correspond with the number and increased size of the teeth required, for the normal arrangement of the permanent ones.

Sometimes the third molars, commonly known as the wisdom teeth, fail to make their appearance on account of the jaws, in some cases, not becoming sufficiently developed to easily accommodate them, and if these teeth develop under such abnormal conditions, the eruption of them is followed with much pain and swelling—in some cases sore throat and constitutional disturbances.

These teeth, if they are inferior ones, are often subject to disease in erupting and create great suffering to the individual, and in consequence of this, they should receive early attention by the dental practitioner.



Permanent upper denture. 1—Central incisor tooth. 2—Lateral incisor. 3—Cuspid. 4—First bicuspid. 5—Second bicuspid. 6—First molar. 7—Second molar. 8—Third molar or wisdom tooth. Note the symmetrical arrangement of the teeth.

There are several factors which may cause an abnormal arrangement of the teeth:

1. Retaining the temporary teeth too long.
2. The presence of extra teeth.
3. Delayed eruption of the permanent teeth.
4. Extracting the temporary teeth too soon.
5. Extraction of the permanent teeth.
6. Mouth breathing, due to enlarged tonsils and adenoid growths.
7. The habit of thumb sucking.

As it has been already said, the too early extraction of the temporary teeth will have a tendency to retard the growth of the jaw, thereby creating a tendency to the forming of spaces, and in consequence of this the permanent teeth are robbed of sufficient room for development, causing them to be forced into an abnormal position.

The unnecessary extraction of the permanent teeth often causes an inconvenience by allowing a tilting of the crowns of the teeth, forming V-shaped openings between

them which are difficult to cleanse. This condition is frequently observed by the extraction of the first sixth year molar.



—F. B. NOYES

The position of the permanent teeth in the jaws; also showing the position of the third molar or wisdom tooth before eruption.

The eruption of the permanent teeth varies as to time in different persons—some are earlier and some are later—but usually the first permanent tooth to erupt is the first molar, known as the sixth-year-molar, and again it must be remembered that this tooth erupts just behind the second temporary molar, and also before any of them are shed. It cannot be too strongly borne in mind that this tooth is the most important one of the permanent set, and by proper development and care much depends upon the arrangement of the rest of the oncoming teeth and also on them depends the dento-facial expression and symmetrical outline. In case the permanent teeth do not develop in proper position in the arch, these sixth-year-molars are of great importance to the Orthodontist in correcting any irregularity of the teeth by using them as anchorage—as the “fixed point”—from which the operation of straightening the teeth begin. The beginning of eruption of the anterior teeth commences about the time when the first permanent molar makes its appearance, and the first of these to erupt are the central incisors from the sixth to eighth year, and soon after

them the lateral incisors appear between the seventh and eighth years.

The next teeth to erupt are the bicuspid, sometimes called premolars, situated anterior to the molar teeth. The first bicuspid makes its appearance from the ninth to tenth years, while the second ones come in very shortly after, between the tenth and eleventh years. Of the temporary teeth it will be noticed that there are no bicuspid, and just here is the characteristic difference in the two sets. The first molar which has already been described, is the most important tooth in the set, and the one which should receive early attention; these teeth erupt between fifth and sixth years, just when the child requires them most, as the temporary teeth are beginning to be shed.

These four teeth assist in mastication while the temporary teeth are shed, and retain the relation of the jaws to each other, also acting as a fulcrum to distribute the muscular force of the jaws.

As the jaws develop, the second molar comes in behind the first molar, but several years elapse between the eruption of the first molar and the second, which is between the twelfth and fourteenth years.

The third molar, known as the wisdom tooth, is the last to appear, and this is usually when the jaws have become fully developed, erupting between the seventeenth and twenty-fifth year. Sometimes these teeth erupt even later in life, and in some cases never appear.

It will readily be observed how Nature has carried out so beautifully the artistic architectural design of the teeth, and the student on a closer study of the general and the minute anatomy of the teeth cannot but be impressed with their wonderful arrangement, their structural form, and their mechanical adaptation to carry out the purpose for which they are chiefly intended—namely, mastication. Before the sacred shrine of some of the nations of the East, the human tooth is the highest expression of their religious belief. The Sacred-Tooth in the Temple of the Tooth, in Kandy, Ceylon, which has commanded the unreasoning homage of millions of devotees of the Buddha religion, has been for ages paramount in their superstitious ceremonies.

The illustration on the title page of this book shows Apollonia, the Patron Saint of Dentistry, who was canonized about 300 A. D. for her zealous devotion to her religion, and not-

withstanding the fact that her persecutors tried to make her renounce her faith by submitting her to the torture of extracting all her teeth, this did not change her belief. For more than 1500 years her mediation has been sought by the adherents of her faith, and her relics have been regarded as possessing great power of relieving pain in dental diseases.

In the make-up of the facial features of man the teeth form a very important part. The temperament of the individual can be determined, and the mental, moral and physical weakness traced in them. Even in the lower animals, according to their classes or species, the teeth have certain physical peculiarities to distinguish one from the other and from those of man.

Most of the lower animals have the same grand organic system as man possesses; the Mental or nervous system; and the Vital or nutritive system. Therefore, the lower animals may possess the same Temperament as found in man.

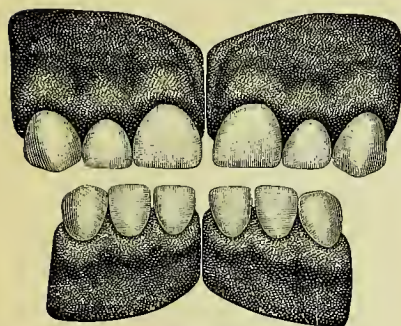
When we compare man with man we recognize certain characteristic traits common to all individuals and no less apparent differences. You will notice one person of imposing appearance, tall, well proportioned and muscular, the other short, sturdy and plump, while another small and slight. Look about and you will see those characteristic traits—yonder man with a dusky complexion, dark and brilliant eyes, that boy with a ruddy bloom upon his face, and the fastidious brown haired girl, whose complexion, so to speak, is like “the blending of the lily and the rose.”

Besides, these differences may be indicated by the appearance of the teeth. one person may have a bronze-yellow shade of teeth, another a cream yellow, a third pearl-gray, and a fourth opaque or muddy.

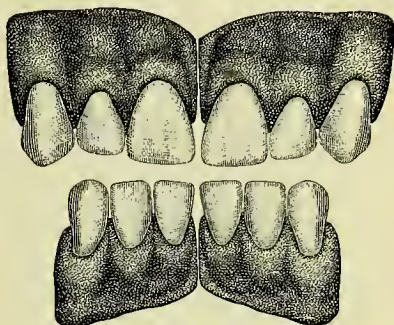
These differences, and many more that could be referred to, which are unnecessary, are the results of the so-called temperaments—which may be defined as “a constitutional organization, depending primarily upon heredity, and consisting chiefly in a certain relative proportion of the mechanical, nutritive and nervous systems and the relative energy of the various functions of the body.”

Temperaments are divided into four basal classes: Sanguineous, nervous, bilious and lymphatic, and these can be blended so as to form twelve more mixed temperaments. These classes are readily observed in the structural make-up of the teeth, so the value of the practical application of the study of temperaments in the practice of dentistry is apparent.

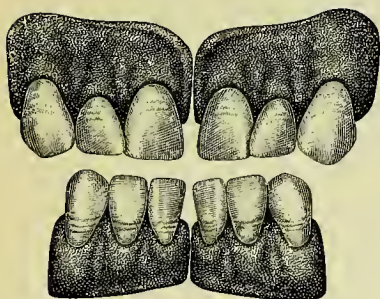
The following table will show the four basal temperaments and their general indications, as applied to the teeth:



Lymphatic



Nervous



Bilious



Sanguineous (S. S. 20.)

THE TEETH AS INDICATED BY TEMPERAMENTS

SANGUINEOUS—The general color of the teeth is a cream-yellow, and slightly translucent; they are well formed and of nice proportion, with fine curved outlines. The surfaces of the teeth are smooth and the cutting edges well rounded and translucent. The articulation is fairly firm and the jaws have a tendency to rotate in mastication.

NERVOUS—The general color of the teeth is pearl-blue and quite translucent and in form they are long and narrow, with long cutting edges and cusps. The surfaces have a glazed appearance and the articulation is very long and penetrating.

BILIOUS—The general color of the teeth is bronze-yellow, and in form they are large and angular and much longer in proportion to the breadth; the surfaces of the teeth have transverse ridges and inclined to a dull appearance; the occlusion is firm and close and the jaws are well locked together.

LYMPHATIC—The general color of the teeth is dark or muddy; the teeth are large and not very well proportioned, short, breadth predominating over length; the grinding surfaces are poorly shaped and when the jaws are in contact there is no lapping or interlocking of cusps.

MASTICATION.

"He who does not masticate well is an enemy to his own life."

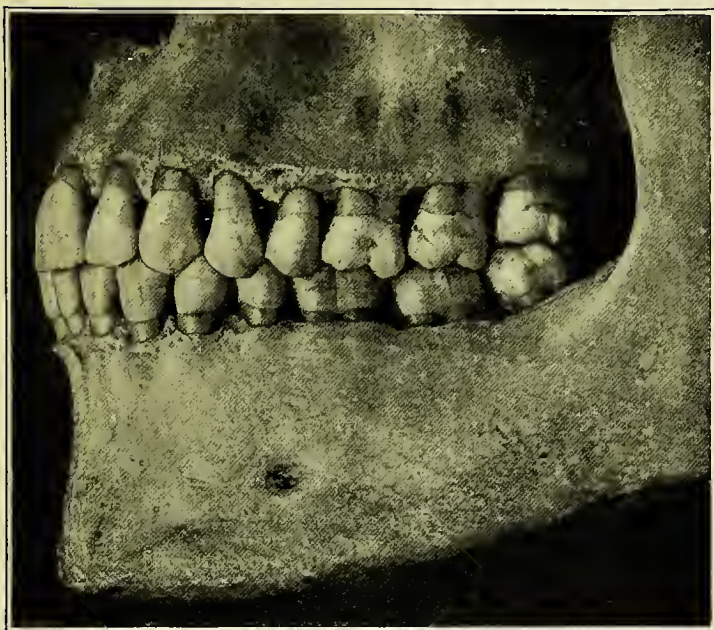
The most important function of the teeth is the mastication or chewing of the food, which is performed by the biting and rotary grinding movement of the lower set of teeth against the upper.

As soon as the food is introduced between the teeth, the more solid portion becomes broken, and by the simultaneous movement of the tongue and cheeks, assisted by crushing the softer portions of the food against the gums and hard palate, and, by this continual action of passing morsels again and again between the teeth, the food becomes sufficiently chewed. Can one imagine a more complete mechanical device than this? It will suffice here to state that the process of chewing the food is partly under the control of the will and also acted upon by the nervous system in an involuntary way, that is independent of our will.

The act of chewing is materially assisted by the saliva or the fluids of the mouth secreted by the so-called salivary glands in greatly increased amount during the process. In this way the food becomes more easily fit for swallowing, and at the same time the intimate incorporation of the food, and the digestive fluid, *the saliva*, allows it to be more easily acted upon in the stomach by the so-called *gastric juice*. Thence the process goes on—the substance already digested is absorbed by the stomach and the remainder, then unfit, is acted upon by the various fluids through the rest of the digestive system; by this time most of the food is capable of absorption, supplying the waste of the tissues throughout the body.

So it is evident that there must be a proper co-ordination in the various processes of digestion in order to produce the greatest efficiency of tissue supply.

Good teeth are not only essential to thorough mastication, but there must be sufficient muscular force of the jaws to crush the particles of food in some persons the pressure amounts to two hundred and fifty pounds to the square inch, while in others the muscular force is very weak. The muscles of the jaws can be developed as well as other muscles of the body, according to the demand placed upon them.



—C. R. TURNER

The permanent teeth in normal occlusion, showing a perfectly designed apparatus for mastication.

It is well to remember the thoughts of Mrs. (Dr.) M. W. J., who so writes in the Southern Dental Journal, as follows:

“Without good teeth there cannot be thorough

MASTICATION.

Without thorough mastication, there cannot be perfect

DIGESTION.

Without proper digestion, there cannot be

ASSIMILATION.

Without proper assimilation, there cannot be

NUTRITION.

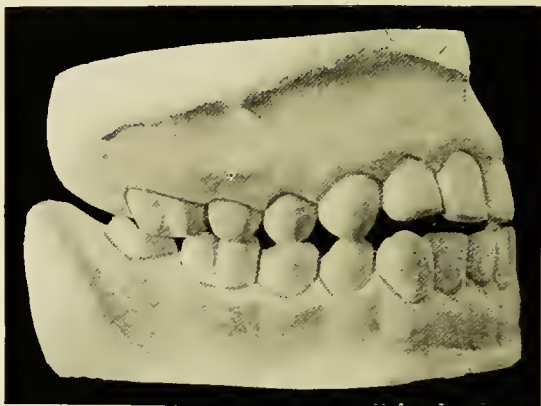
Without nutrition, there cannot be

HEALTH.

Without health, what is

LIFE?”

It is the duty of the dentists to inform their patients of the importance of thoroughly chewing the food, and it is also the duty of the parents to instruct their children to eat slowly, no matter how hungry; it is far better to have a little food well masticated than a generous meal eaten in haste. There are many dyspeptics and persons who are victims of mal-nutrition caused by the careless habit of eating, or the inability to properly prepare their food for the stomach.



With such an abnormal arrangement of the teeth it would be impossible to properly masticate.

It has been said of Gladstone, the great English statesman, that he fully realized the benefit of thorough mastication when he made it the habit of his life to chew, to a soft mass, every mouthful of food before another mouthful was taken, and it was his custom to give every mouthful thirty-two bites—which represented a bite for every tooth he had—and as he had a full set of thirty-two teeth, this meant thirty-two bites or grinding of the food before it passed from the mouth to the stomach. This he attributed, as one factor in the prolonging of his life.

Dr. J. J. McCarthy writes in *Pearson's Magazine*, that the great American habit, the "bolting of food," is one of the most serious conditions of our modern life." This habit is usually acquired during the early years of childhood and carried on during one's whole life. In many of the homes, the early morning hours are given to preparing the children for school. Very frequently they are permitted to sleep late, and in the hurry and bustle to get them to school on time, the breakfast is bolted. These same conditions of hurried meals apply to the lunch hour

and supper time. . . . We have a lesson every day of the bolting of food. Walk into the quick-lunch rooms of the city and see these "hustlers" at work. Look down the long rows of tables, see the rapid movement of the diners, and you will liken it to a quick-eating contest, for which prizes are offered to the fellow who gets through first. Many of these lunch rooms advertise how quickly you may be filled from their larder, and take a pride in the number that can be served in a given time. No doubt much of their trade comes from people who want their eating over in a hurry. The average business man almost begrudges the time given to eating; it is rarely a pleasure with him, especially the lunch hour repast, and he goes at it in a vigorous, may I call it a pugilistic way, and fights the food to a finish. As he walks out, he seems to say, "Well, that thing is over." When his stomach, as all stomachs will when given such bad treatment, rebels and he becomes a chronic sufferer from indigestion, he wonders how it all happened. The doctor knows, but the advice many times is too late, and if given, is often forgotten."

Also, no less eminent authority of medicine than Dr. Osler has remarked that the American nation could be divided into two classes, bolters and chewers, with the bolters leading by a large majority. At a meeting of the Indiana Dental Association, Dr. D. H. Sexton, of Shelbyville, Ill., gave a very important discourse on this subject, and suggested that a national movement should be organized and known as the "Chewing Movement." His address was in part thus:

"The education of the average man, woman and child has been sadly neglected. They have been taught to eat but have not been taught to use their teeth. When we bolt our food, we ignore one of the most important ferments, ptyalin, in our saliva, that has much to do in the process of digestion. But the American habit is to spit, and the Americans are the greatest spitters in the world. Between meals they will spit the invaluable saliva; then when they eat they wash every unchewed bolus of food with copious draughts of water, coffee, or in summer, iced tea. What a foolish, disgusting habit it is and more than foolish, more than disgusting—it is killing in its hurtfulness. An habitual spitter at middle age will have the broken-down digestive apparatus of an old man at seventy-five. Men who bolt their food, who put their saliva out of business, are drug-shop chasers and slow suicides."

Some years ago when Charles Dickens, the novelist, was on his visit to America, he was much impressed with the business man's habit of eating, and, as he was fond of relating that it was worth the price of an admission fee to be present at meal time, as the rhythmical movement of the diners always reminded him of the rocking beam up in the old wheeled steam boat—while one hand was carrying food to the mouth, the other was going down after another supply.

It is a bad habit to mix the food with liquids while in the act of chewing, or to "wash" every mouthful down into the stomach; but if one desires to drink during meals, it should be done after eating or when the mouth is empty.

The chewing of the food should not be confined to one side of the set, but both sides should be equally used. This will create a more thorough mastication as the food will become better mixed with the saliva and, at the same time, there will be a more complete use of all the teeth.

Not only will there be a deficiency in mastication when the teeth are partly absent, especially the molars and bicuspid, but it will also cause an unequal development of the muscles of the face, thereby affecting the expression. Ben Hur, the Prince, who was condemned for life to the Roman galleys, asked a special favor—that he might be allowed to change from one side of the galley to the other, so that he would not have to continually use one set of muscles. Is that not a lesson which can be applied to mastication?

It is highly important that the food should not enter the stomach in a lumpy condition, as it may possibly cause irritation of the stomach, thus leading to indigestion or dyspepsia and ultimately to chronic catarrh and invalidism.

Mr. Horace Fletcher, the great American economist and wealth-giver, who is devoting his time to teaching people that Right-Eating lessens food expense, with a greater increase in energy or endurance, describes in one of his lectures the results of proper dieting as he advocates in his own case: "It was in Chicago that I started my study of nutrition thirteen years ago. Then I was a business man, broken down in health, and had been denied life insurance by pessimistic physicians. To-day, at sixty-one, I am hounded by solicitors, who offer me reductions in insurance premiums.

Fletcherism means eternal chewing—chewing until the food swallows itself. Every mouthful should be chewed until the

last vestige of taste has departed. An experiment will prove that it is not a task to practice my system. It will be found that the simpler foods, bread and butter and potatoes, lend more enjoyment to the palate when Fletcherized than the most highly seasoned concoctions. Before the taste of each morsel has gone, the palate will have experienced sweetness beyond the wildest dreams of a confectioner. As a matter of fact, Fletcherism is so simple, it is ridiculous. The only thing necessary to be a Fletcherite is to have a good set of teeth and a willingness to give the system a fair chance. The only thing that need not be Fletcherized is water, which has no taste."

To prove Mr. Fletcher's statement of the results of proper mastication, take for example the eating of a soda biscuit, in one case when it is chewed and swallowed quickly, without the thorough mixture of the saliva, it does not become so palatable, while in the other case by thorough mastication the taste becomes extremely exquisite.

Much could be said here on foods and their adulterations, but it will only be possible to make slight reference to them. To have proper tissue supply, there must be sufficient nutritive substances both in quality and quantity; so the purpose of food is to build up the tissues during their development, to replenish waste tissue and also to give heat and energy to the body.

It is commonly known that a large percentage of man's earnings is used for food products, and that if nutrition was better understood he would realize a greater income for old age, and also greatly benefit from a health standpoint. If greater care was taken in the selection of proper foods, free from any impurities and adulterations, better results would follow, as it is generally known by food experts that many of the diseases of the digestive organs are caused by improper preparation or by excessive consumption.

For the welfare of the public there have been laws enacted, known as the pure food laws, to lessen the crime of unscrupulous dealers and manufacturers. Take, for instance, the rigid laws against the sale of impure milk. This product is of extreme importance to the public, especially in the feeding of infants, and the law against the vendors of impure milk has been, from time to time, strictly carried out by the health departments of every community, to eradicate diseases which have been traced to impure milk supply.

Thus, the supply of pure food will enrich the blood, strengthen the muscle for greater endurance, give greater firmness to the bone, tone the nervous system for greater activity of the brain, and likewise give the proper nourishment, which will develop proper tooth structure sufficiently dense to resist decay.

DECAY OF THE TEETH.

The decay of the teeth, or caries, as it is named, is the most prevalent disease which affects the human race. It abounds in most every mouth, and is destructive of the facial appearance, health and comfort of the individual.

It appears to be a malady which has developed as the outcome of modern civilized life, for it is most common among those nations which are considered as having the highest civilization; and still, no race of men whether in a civilized or barbarous state, either in modern or ancient times, have been wholly immune from this disease. Dental historians tell us that the disease was prevalent among the ancient Egyptians, as many of the mummies seen in our great museums have well marked traces of caries and other diseases of the teeth. In the British museum there is a mummy four thousand years old, showing well marked traces of decayed teeth.

Even in the early and later periods of the Greek race there is still a greater proof that this disease existed, for Herodotus tells us that they had doctors for the ears, doctors for the eyes, as well as doctors for the teeth, and that they possessed a knowledge of treatment of caries and of relieving the pain of toothache.

As far back as evidence can be obtained either from historical data or research, the decay of teeth has been known, but it was found not so prevalent in the aboriginal tribes who lead a simple life; while, with those nations, ancient or modern, which had obtained high state of civilization, surrounded by luxuries and habits of an enervating nature, the disease was very common.

The Anglo-Saxons of America and Great Britain, as well as the other influential nations of Europe suffer most from the decay of teeth, and according to statistics of recent date, it is increasing with such rapidity as to cause some steps to be taken by the authorities of state to check this very destructive disease.

Simply expressed, decay of the teeth is a progressive destruction of the structural elements of the tooth, and this disease may affect any portion of its surface, such as the hard enamel or the root of less dense structure, but is chiefly found

to originate on the surface of the teeth where they are not self-cleansing; thus, the decay is found to be more common on the grinding surfaces of the teeth, into the depressions and fissures where there are openings caused by improper union of the enamel, and between the teeth where the food is more likely to lodge. The extent of the decay of the teeth in different persons will depend on the perfection of construction of the teeth, character of the fluids of the mouth, the hygienic surroundings which prevail in the mouth and the general health.



Specimens of incisor and bicuspid teeth showing the ravages of decay.

Decay is caused by an acid, and the acid is produced by micro-organisms; when the enamel or outer portion of the tooth is defective, the softer portion beneath the enamel, called the dentin, becomes dissolved by the accumulation of acid until, eventually, if the infected area is not checked, the disease or decay will reach the vital part of the tooth where the nerve is located, thus setting up intense inflammation and with probable loss of the tooth. The nerve is situated in the centre of the tooth, and on its exposure to heat or cold or even slight pressure, say for instance in biting, causes intense pain. This condition is experienced by most every one in the act of chewing. These are not the only serious results, but decay and dead teeth may



Specimens of molar teeth showing decay.

set up an inflammatory condition of the bony structure surrounding the teeth. The result of this neglect will be swelling of these parts accompanied with agonizing pain, a feverish condition of the whole body followed with intense nervous depression



Sectional view of an incisor tooth showing caries affecting its vitality.

and loss of appetite. If the disease is not checked, it may lead to more serious results, for if the pus or poisonous substance is allowed to pass into the system it may so derange the vitality

as to bring about some form of constitutional disease. The temperament or general make-up of the individual has a great deal to do with the severity of the pain. Those who have a very highly nervous organization suffer more than others, while in either case those who are already affected with dyspepsia, worry, nervous prostration or any other cause which depresses the vitality, are subject to still greater suffering.

Bacteria, which causes such disastrous diseases as typhoid and scarlet fever, influenza, pneumonia, diphtheria, tuberculosis, etc., find the most favorable breeding place in the mouth.



The results of the much neglected teeth of children.

The late Professor Miller, of the University of Berlin, has shown that nearly all the diseases producing bacteria have found free habitation in the mouth, lurking in the cavities of the teeth, infesting the deposits upon the teeth, multiplying with great rapidity beneath the soft and inflamed gums as well as on the surfaces of the tongue and tonsils—in fact contaminating the pure fluids of the mouth into a cess pool of defilement.

Dr. Burton Lee Thorpe, of St. Louis, claims that the mouth is the breeding place of the germs of influenza, and from this disease those with hygienic mouths are practically immune.

That a person may become affected with tuberculosis from decayed teeth has been proven to be true, according to scientific

investigation, as the bacilli may gain entrance into the pulp canal and also into the bony structure supporting the teeth. Close scrutiny of the teeth, in carrying out every hygienic measure, will lessen the prevalence of this disease, and by the skilled hand of the Dental Specialist much of the disease can be prevented and many of the teeth restored to usefulness.

Referring to the teeth and their diseases, Professor James Garretson, late Dean of the Philadelphia College of Dentistry, wrote: "Alluding to American women and their early decay, James Paul, M. D., in the best paper on the subject ever met with by the author, laments the fact that even the progeny of other continents coming to this show expression of degeneration, as far as the teeth are concerned, even in the very first generation."

"The refusal of Europeans to drink of ice water is a matter familiar to the writer from personal observation, and not less common is knowledge of the inference drawn by that people that if Americans indulged less in iced refreshments, their teeth would be proportionately better. That dental caries has not its existence, however, in cracking of the enamel, arising out of violent alteration in temperature, needs but little observation to decide.

"Caries may, and assuredly does, show itself in sulci and fissures, but it is so frequently met with under the reverse circumstances as to declare the former not a necessity to its appearance. That alterations of extreme in cold and heat are after other manner injurious to the health of teeth is as truly and plainly evident as that the general health is thereby affected."

A well developed and regular set of teeth is less liable to be infected with decay than an irregular one, for if there is any irregularity or improper lack of development of the teeth, these conditions allow the lodgment of food, thus facilitating the development of decay.

Some teeth decay more rapidly than others, and as some people are led to believe that their teeth are so "soft" that it is of little use to save them, it must be borne in mind that it is not the structural properties of the teeth, as regards their hardness or softness, that depends upon the development of decay, but the surrounding condition they are in.

It is quite evident, in mouths where the saliva is mixed with putrid, slimy substances, that the decay advances much more

rapidly, because the teeth and gums become coated with such putrid matter, making a very fit soil for the development of the germs of decay.

Every effort must be made to prevent decay of teeth, and this can be done for the coming generation, providing the children's teeth are regularly examined and such treatment and correction made as is necessary, and above all to teach and assist them to keep their mouths clean.

DEPOSITS ON THE TEETH AND DISEASES OF THE GUMS.

There are other causes besides decay which have a destructive action on the teeth, and that is deposits upon them and the diseases which affect the gum tissue. It has been estimated by some authorities that more teeth are lost as the result of these conditions than by actual decay of the teeth themselves.

The deposits upon the teeth, which is commonly known as "tartar," or more properly called Salivary Calculus, is as the name implies, chiefly a deposit from the saliva, and through certain changes in the mouth it is deposited in the form of scales upon the teeth. This deposit accumulates more abundantly where there is more or less loss of the use of the teeth, or by improper mastication, especially if the chewing is confined to



The results of much neglected teeth; the accumulation of deposit and disease of the one side of the set. This condition is generally brought about by the teeth becoming so decayed as to reach the nerves, and thus causing intense irritation in the act of chewing the food.

There is another deposit which accumulates around the roots of the teeth, which has a decided action upon the gum tissues, to such an extent as to cause irritation and eventually the formation of a purulent discharge from pus pockets which form beneath the gum. This disease is known as *Alveolar Pyorrhæ*. This disease is accompanied by very little pain, but the characteristic odor and the unhealthy discharge may, if not checked, derange the health of the individual.

This disease is one of the worst maladies which the dentist is called upon to treat; however, the disease yields to treatment if the case is taken in time, the cause removed and the gum tissue treated so that it may be restored to a healthy state, in order to prevent the recurrence of the disease. Providing the chronic discharge of pus is not removed from around the teeth, it will so act upon the gum, and in fact the bony structure in which the teeth are imbedded will be absorbed, and eventually bring about complete loosening of the teeth, necessitating their removal.

HOW TO KEEP THE TEETH CLEAN AND HEALTHY

"A clean tooth never decays."

There are a great many people who do not realize the intimate relation between the mouth and the other parts of the human system. The mouth and associate parts have been termed the gateway to the rest of the digestive tract, and in consequence of this fact these parts should be kept in a wholesome and healthy condition.

It is only within recent years that decay of the teeth has been proven conclusively to be due to a great extent to fermentation, bacteria, and that putrification of the particles of food which cling to the teeth, frequently becoming a centre of infection and disease.

The importance of proper attention to the cleanliness of the teeth cannot be overestimated, and yet there are very few, even those who take some personal pride in their teeth, who give sufficient attention to them. What a charm a beautiful set of teeth gives to the delightful emotional expressions of an individual! Even when Egypt was at her height of civilization, according to documents handed down to us, they possessed a knowledge of how to keep the teeth clean and white.

From the ruins of ancient Babylon have been unearthed stone tablets, the interpretation of which shows without a

doubt that those ancient people also possessed knowledge of how to retain the beauty of their teeth. Beautiful teeth of women during all ages and in all countries have been expressed in poetic writings as one of their chief charms. In the present age, decay of the teeth is such a prevalent malady that it requires every prophylactic measure to be taken to retain them; man in his primitive state did not require to care for the teeth, as the food he subsisted on was mainly of uncooked animal and vegetable diet, and was not prepared according to our modern culinary methods.

As a preventive of decay of the teeth, and diseases affecting the gums and associate parts, constant attention to thorough cleanliness is of great importance, for, if the particles of food are allowed to remain between the teeth and gums until in a fermented and foul condition, it will hasten decay of the teeth and also set up inflammatory condition of the gums. To allow this condition to go on with an accumulation of deposit about the teeth also destroys the gum tissue and eventually causes the teeth to become loosened. In this filthy or unhealthy condition, the breath becomes very offensive, the saliva becomes mixed with putrifactive and poisonous substances; finally, with marked disturbances throughout the body, such as indigestion, loss of appetite, pain in the ears and head, neuralgia, affections of the eyes and a general loss of health follow. As has already been said, the presence of decayed teeth, roots and infected purulent gums pollutes the saliva and when swallowed cause an irritated effect on the delicate mucous membrane of the stomach and also contaminates the breath with infective germs causing irritability of the bronchial tubes and ultimately tubercular affection of the lungs. In view of this fact, how pitiful the neglect shown by some parents in allowing their children to develop into womanhood or manhood without impressing upon their minds the importance of acquiring the habit of keeping the mouth in a perfectly healthy condition. Prevention is much better and easier than cure, and your dentist that prescribes to you and advises is as vital and necessary to family health as a family physician, and one should be consulted at regular intervals.

CLEANSING THE TEETH AND MOUTH.

The first requisite in cleansing the teeth and mouth, other than by natural process of mastication, is the proper use of the

tooth brush. Care should be taken in selecting a brush, and the condition of the teeth and gums should be considered; for some persons a soft bristle brush would be best for removing the debris about the teeth without injuring the delicate gum tissue; while for others a coarser brush would be more effective. However, before selecting a tooth brush, one can be greatly assisted by the aid of a dentist, as he will be able to tell you the kind that will be best suited to your teeth and gums. For many years brushes have been made too large, but it is now possible to obtain them almost ideal in size and shape; at any rate, one should select a brush that will readily pass between the cheek and the back teeth. Most people in their hurry and bustle think it only necessary to brush the teeth that are visible, and overlook the posterior teeth. These are in greater need of attention than the anterior ones, since they are put into active use in chewing the food, and it is more likely that food will deposit about them. On account of the third molar or wisdom tooth occupying the most remote place in the set, it is more likely to become neglected, if too large a brush be used.

Where the gums are inflamed and sore, softer brushes are first advised, until such time as the tissues become healthy and normal.

Children should use a brush with bristles shorter and smaller in size than those of brushes for adults.

In the ideal brush, the handle should be slightly curved, and the curve on the brushing surface should have a slight concavity so as to fit against the front teeth; the handle should be slightly flattened to prevent rotating in the hand while in the act of brushing. You will observe that the ends of the bristles are cut with a slight curvature, and have slight tufts at the extreme end, thus greatly aiding in reaching extreme places.

There is a proper way to brush the teeth which everyone should know. Brushing the teeth cross-wise or in a see-saw manner is wrong, as only a small surface of the teeth are cleansed, leaving the most important part unbrushed between the teeth where the food has a chance to accumulate. The upper teeth, outer surface, should be brushed from the gum surface downward to the cutting edge of the teeth—that is, lengthwise of the teeth, with slight rotation of the brush. This will allow the bristles of the brush to pass between them and thus remove more readily any lodgment of food.



Brushing the outer surfaces of the teeth by placing the bristles of the brush against the gum and rotating towards the grinding surfaces. 1—The uppers downward. 2—The lowers upward.



Brushing the inner surfaces of the teeth by placing the bristles of the brush against the gum and rotating towards the grinding surfaces. 1—The uppers downward. 2—The lowers upward.

The lower teeth are brushed in the same way with slight rotary motion, from the gum upward to the edge of the teeth. The back or posterior portion of the lower anterior teeth should be cleansed with the ends of the brush by an upward stroke from the gum to the upper part of the teeth; the same surface on the upper teeth is brushed in the same way. The inner



Brushing the anterior teeth by drawing the bristles of the brush from the gum to the cutting surfaces of the teeth. 1—The uppers downward. 2—The lowers upward.



1.—Brushing the surfaces of the teeth around the margin of the gums. 2.—The application of the silk ligature for removing the debris between surfaces of the teeth.

portion of the teeth on either side of the tongue should not be overlooked while brushing, as the particles of food find lodgment in this direction between the teeth, and should be brushed in the same way as the outer surface of the teeth. Much harm is done by too vigorous brushing and with an unsuitable brush. The grinding surface of the teeth can be brushed in a to and fro way.

The method of handling the brush, as described, may be awkward at first, but by a little practice becomes equally as easy as the old way. The care of the brush is important.

Before using the brush, the bristles should be immersed in water to soften them, and after using should be washed and dried and put in a proper receptacle for sanitary keeping. Tourists and travelling men should carry their tooth brushes in a tooth-case to keep them from filth and germs of disease, and not carry them in their vest pocket, as is frequently seen, or among their belongings in their travelling bags, or while in their homes they should not allow the brush to be thrown aside on the wash toilet or in the soap receptacle, to be mixed with all kinds of germs. Most brushes do not receive much attention after being used, but are left in a damp condition, collecting dust and dirt, which makes them quite unfit for further use.



Tooth Case.

The brush should be thoroughly washed after each using; every trace of powder should be removed. This is nicely accomplished by allowing hot water to run through the bristles, after which the brush should be thoroughly dried with a clean cloth

kept for the purpose. Occasionally it should be immersed in an antiseptic solution. Brushes should be purchased frequently; in fact, a new brush should be obtained about every two months. When choosing a brush do not select an inferior one as the bristles are likely to break and lodge between the teeth after brushing. It has been told by someone that he overheard a customer ask a merchant for three brushes—one for herself, one for her husband, and one for the spare room.

In some cases, where the gums are very sensitive, frequent massaging should be done several times a day until they become sufficiently firm to allow ordinary brushing. The use of unstarched cheese cloth cut the size of an ordinary handkerchief, wrapped over the index finger, is an excellent material to wipe the mucous and food from the gums, as this fabric has a mesh woven constituent.

Thoroughly rinsing the mouth after eating is an excellent way to dislodge the particles of food which collect between the teeth. There is a right and wrong way to rinse the mouth to be most effective; by the action of the tongue and cheeks, the liquid can be forced to and fro between the teeth very effectively. With reference to the selection of any preparation which will be most suitable in each particular case, the advice of a dentist should be sought. The use of a good tooth powder or camphorated chalk cannot be over-estimated as an excellent material for both cleaning the teeth and hardening the gums; it can be applied with a piece of cloth, or sprinkled on the tooth brush. Tooth soaps have not the endorsement of dentists, nor have some of the pastes that have been rushed on the market in recent years. However, if pastes can be prepared without the sugar constituents, they have as beneficial results as any preparation that can be had.

To obtain a proper hygienic condition of the mouth, the cleansing and washing of the teeth should be carried out at regular intervals, after each meal, and the mouth finally cleansed with a suitable mouth wash; more especially should this be attended to on retiring at night and upon arising in the morning.

While cleansing the teeth, it is advisable to use judgment in the amount of *force* used, so that the gums will not be injured or pushed away from the neck of the teeth.

Prescriptions for dentrifices and mouth washes have long been known, for dental historians say that the ancient Egyptians used various preparations to keep the teeth and mouth in

a prophylactic condition, long before Moses taught the children of Israel that cleanliness was next to godliness.

In the sick room every attention should be given to the patient, by the nurse, in carrying out thorough and systematic toilette of the mouth and teeth, especially should extra care be taken if the patient is suffering from some of the highly infective fevers.

The mouths of patients who are unable to help themselves should be brushed by the attending nurse two or three times daily, care being taken to cleanse the spaces between the teeth and around the margins of the gums where the debris is likely to lodge.

Usually the method employed in hospitals is to cleanse the mouth and teeth with a cloth. This, however, will only remove the mucous and food from exposed surfaces. To cleanse between the teeth a small size tooth brush should be used, so that it can be easily applied and used without any inconvenience to the patient. If the mouth shows an acid condition, antiseptic lotions should be used on the gums, teeth and tongue, such as limewater, bicarbonate of soda or the milk of magnesia, as may be prescribed by the physician in charge.

Baby's teeth should be looked after as soon as the first one makes its appearance, and should be continued until the child is old enough to take care of them. It is advisable even before the baby's teeth appear to wash the gums with a soft linen, saturated with an alkaline solution, such as magnesia; this the mother can easily do by wrapping the cloth over the index finger, dipping it in the wash and then applying it to the gums.

It is advisable to commence using the tooth brush when the baby has two teeth. The brush should be small, the bristles short and soft, and sufficiently narrow to reach between the gums and the teeth.

There is another feature in the care of the teeth, and that is the judicious use of the tooth pick, which if properly used and of suitable form, may be used where no other means are possible to remove the particles of food in narrow spaces between the teeth.

The tooth pick must not be overlooked, nor can it be overestimated as a good medium in preserving the natural teeth, notwithstanding that polite society would like to banish this useful instrument from the table and discourage its use.

Wooden tooth picks should not be used as they are made too blunt and have a very injurious effect on the gums by forcing

them away from the neck of the teeth, and after continuous use for some time, will leave open spaces between the teeth and gums. These are the kind of tooth picks which are so commonly noticed in most dining houses. The quill is the best, as it is thin and flexible, and will readily pass between the teeth, and does not break between the teeth as is so frequently the case when wooden tooth picks are used.

Floss silk can be used to a great advantage where it would be impossible to remove all the particles of food with a pick, but if used, care should be taken in passing it between the teeth so as not to injure the gum, as it may by continual use drive the gum away from the neck of the tooth. The constant habit of picking the teeth should be discouraged, and the habit limited only for removing the particles of food which accumulate between the teeth.

There are some very excellent antiseptic mouth lotions which can be had, also a very large variety of powders and pastes, most of which can be well recommended, and the dentist may advise them to his patients, as most of them are reliable. A very effective way to use mouth washes, as suggested by an eminent New York Dental Specialist, is to force the solution between the teeth by means of an atomiser.

So, in using whatever means to obtain a perfect cleanliness of the mouth and teeth, do not brush them for cosmetic reasons, but strive to keep them in such a way as to prevent disease. It is the duty of every dentist to instruct his patients the need of strict hygiene of the mouth, as a preventive against diseases which are common to the oral cavity.

In an address to the students of the Royal Dental Hospital of London, Dr. Osler said: "You have just one gospel to preach, and that is the gospel of cleanliness of the mouth, cleanliness of the teeth and the cleanliness of the throat. These three things must be your text through life. Oral hygiene—the hygiene of the mouth—there is not any one single thing more important to the public in the whole regime of hygiene than that, and it is with that that you, as practitioners, will have to deal."

NORMAL AND ABNORMAL EXPRESSIONS OF THE FACE.

"The best balance, the best harmony, the best proportions of the mouth in its relations to other features, require that there shall be the full compliment of teeth, and that each tooth shall be made to occupy the normal position, normal occlusion."

It is not the purpose of the writer to go into any detail regarding the artist's view on the subject of facial expression, or describe any particular type of beauty (which they consider ideal), but will give a few facts worthy of consideration as to the physical appearance of the face and also the results brought about by improper development of the teeth and adjacent parts from disease.

There is no absolute standard of human beauty, but beauty has been described as "the assemblage of graces or of properties which please the sight or any of the other senses, or the mind; the quality of an object which delights the esthetic faculty."

It is quite evident from observation that there are no "fixed lines of harmony," but that beauty of the face depends upon the proper balance of the features according to the particular type, as illustrated, as for instance, the exemplification of beauty of Grecian art in the exquisite outline of the features of Venus as a standard of excellence of feminine beauty, or that of Apollo, who is generally represented with a face beautiful, oval and regular outline; or if the reader goes to a more unique source, our English Bible, he will find therein described instances of health and beauty of form, and symmetrical contour of features of Rachel, the Queen of Tragedy. The accompanying illustration will explain the perfect harmony of features of this particular type, but harmony of the features exists in other types of temperaments than the one described.

The prevalence of ugliness of the face is quite marked in the human race. Zeuxis, the great ancient painter, who endeavored to portray an ideal face, sought separate parts of living models; from Aglaia he chose a brow; from Myra the lips (including the teeth); a nose from Lydia, etc. These different features were united in one subject by him to produce what he considered a face beautiful.

In studying the features of a facial profile it will be noticed that there is harmony of proportions of a well-balanced face, as there is a correspondence of measurements throughout the face; the distance between the chin and the nose should be equal to

the measurement from the nose to the most prominent part of the forehead. So it is evident that, if there are physical defects in the proper development of the teeth, or the bony structure supporting them, or if the teeth are very irregular, so as to cause

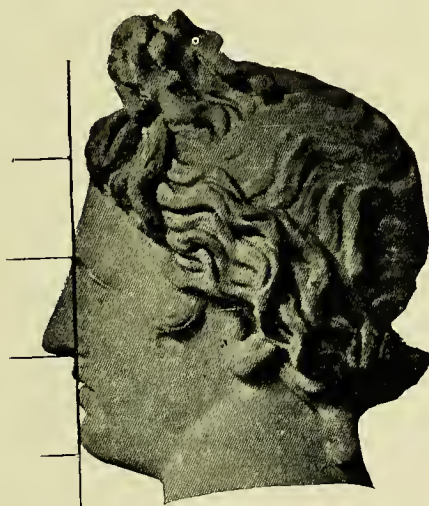


Beauty of the face depends upon the proper balance of the features according to type. a narrowing of the breathing space through the nose, then the air passing into the lungs will be greatly affected. When the nasal passages are partly closed, caused by the improper development of the bones of the part or other obstruction of those passages, mouth breathing develops, the upper teeth protrude and the lower ones recede and the mouth remains open, giving a weak and undeveloped appearance to the face.

The habit of breathing through the mouth should be avoided, as the air does not become sufficiently warmed to enter the lungs, but people should create the habit of breathing through the nose as the air becomes also more purified of dust, etc. Parents should encourage their children to practice the habit of breathing through the nose, as it will be a safeguard against throat, nose and lung diseases.

Through the improper development of the face and teeth the appearance of some people are so affected as, in some cases, to become almost a positive deformity. One of the principal causes of deformity or irregularity of the teeth is the early loss of the temporary or milk teeth, thus allowing the rest of the teeth to close in the space that should be retained for the last or permanent ones. The time for the removal of the milk teeth is when

the permanent ones are ready to erupt, thus allowing the teeth to be shed and the permanent ones to take their place, when nature requires them; the development of the teeth and jaw



will not be interfered with, but if the teeth are allowed to erupt in their proper order there will be a more symmetrical development of that portion of the face. Frequently the teeth become irregular by the loss of the first permanent or sixth-year-old molar, as this tooth is the most important tooth of the whole set, for it locks the other teeth in position, thereby preventing any irregularity in their eruption.

To those who are engaged in professional pursuits, such as teachers, actors, public speakers and singers, it is very essential to have a well developed set of teeth and face, as the enunciation and articulation of speech is greatly aided; and in case of singers, it would be almost impossible to emit a pleasant vocal tone when the teeth are even partly absent, or any mal-formation of the nasal cavities. Much good can be done by the Dental Specialist, the Orthodontist, in restoring the teeth and jaws to their normal functions and thereby increasing the usefulness and beauty of the teeth.

The aim of the Orthodontist is to guide Nature back in the right paths of development; not to extract teeth to overcome crowding in the arches, but to expand the jaws so that they will be large enough to accommodate comfortably all the teeth that Nature gave us, and that are requisite for the proper development of the face and proper mastication of food.

The mouth, including the lips and surrounding parts which cover the teeth, is the most expressive portion of the face.

From the mouth all the emotions of the intellect find issue—joy, grief, anger and respite; through it comes the melody of sound, of laughter and song and the talent of oratory, and still further, the expression of the face portrays the mental temperament of the individual.

Mme. Lina Cavaliere, in one of her series of articles, "How to Train Children to Be Beautiful," says: "If the baby has inherited beauty, so much the better, though it has often happened that some good looking parents produce ugly children and plain parents beautiful offspring. The laws governing the transmission of beauty have not become well known, or at least not thoroughly understood. But even if baby is born beautiful, her beauty must be nourished and preserved.

"The contour of the face is a most important consideration, especially if seen first in profile view. It is what makes the first distinct impression upon the beholder, and upon the first impression much depends. The growing improvement in the science of dentistry teaches that the first teeth, considered as a mere unimportant item, to be gotten rid of as soon as possible, is a mistake. In this advanced stage of dentistry it is known there is no need of "undershot" or "overshot" or otherwise malformed jaws. Intelligent dentistry teaches the mother that unless the milk teeth appear at the proper time and in the proper place, the second or permanent teeth will appear in the wrong place and time."



Protrusion of the lower jaw.



Retrusion of the lower jaw.

"Had King

of Spain had the benefit of intelligent

dentistry of to-day, he would not have his singular and unpleasant profile. For this reason it is a great misfortune for a baby to loose one of its first teeth. The child's jaw should both be large enough to accommodate the full set of thirty-two permanent teeth."

Madame Teru, in *Physical Culture*, writes: "Aside from the important factor in the appearance of the face that one is never considered really beautiful unless possessed of good teeth. Nevertheless, let no one imagine that I underestimate the importance of the functions of the teeth; for, after all, all things must work together for one great good; and food that is not properly masticated will cause indigestion—and who ever heard of a beautiful dyspeptic?"



Casts of the face and teeth, before and after dental operation. "Shows the changes which may be made in the facial lines by orthopedic movement of the teeth and alveolar process, without reference to any oral or nasal diseases."—(C. S. CASE.)

"I think that none of the rules ever laid down by beauty doctors are as important as those that demand the systematic care of the teeth." Another cause of protrusion of the upper teeth may be brought about by thumb-sucking, producing a complete change in the facial outline with a development of the so-called "squirrel face," as the appearance of the child's face indicates its name.

What is known as the "adenoid face" is another hindrance to the beauty of the child, caused by an enlargement of the

tissues of the back part of the nasal passages and the tonsils proper, known as adenoid growths. These growths also bring about mouth-breathing with a decided effect on the teeth and mouth, together with other morbid conditions of expression well known to the medical practitioner.

Nasal obstruction in children between the ages of five and twelve years is very common, and is generally caused by adenoids and enlarged tonsils. Children suffering from adenoids are mouth-breathers, with the mouth open, and the lower jaw has a tendency to droop; the normal facial expression is considerably lost on account of the tension of the cheek muscles.



A typical adenoid case, a bad mouth breather, and possessing the muffled tone to her voice in talking."—(H. L. PULLEN.)

Children thus affected are likely to become mentally and physically deranged, and in many instances have a vacant appearance. Usually the child's hearing becomes much affected and its education becomes greatly impaired on account of this trouble existing. The face is pale and has a pinched-like appearance, and the whole make-up of the child shows an unhealthy condition, hence the immense importance to remedy this defect in the breathing apparatus; breathing through the nose, the pressure of the air will have a tendency of preventing the excessive growth of adenoid tissue.

The tonsils are glandular organs situated at the back part of the throat, on either side of the palate, and their function is

not quite definitely known, but it is a well-known fact that these organs are commonly subject to disease, and especially in children are a menace to their health and development. When frequently inflamed they become much enlarged, causing much difficulty in breathing, the hearing becomes much impaired and the voice also becomes greatly affected, in many cases so much so, that it would be impossible to produce pleasant vocal tones. Prospective students in vocal culture should have their throats examined by their instructors to determine if these organs are normally developed, for, if they are abnormally developed or diseased, they will be quite unfit to follow such a vocation. It is not uncommon to find school children suffering with ordinary sore throat, especially in the colder seasons, and every precaution should be taken, as it may be mistaken for diphtheria.

Through the efforts of the Orthodontist and the throat specialist, much good can be done in removing the cause of these maladies.

According to statistics it has been proven that fully two-thirds of the cases of deafness in children, and more than one-half of all cases of impaired development are the result of adenoids. Throat Specialists claim that the removal of these growths are almost as simple and less painful than the extraction of a tooth.

Dr. Woods Hutchinson, the leading advocate of medical hygiene in the United States, states that ten years would be sufficient to eradicate this, the worst scourge of children, if an intelligent and hygienic teaching was carried out.

Captain George Catlin, who over a century ago, while devoting his time to the study of Indian life in the two Americas, drew the conclusion that mouth breathing was a destructive habit, and to be one of the causes of tooth decay and some of the acquired maladies in modern civilized people.

While in his prime of life, and suffering from bodily infirmities, he graphically describes his condition:

"I penetrated the vast wilderness with my canvass and brushes for the purpose which has already been explained, and in the prosecution of which design I have devoted most of the subsequent part of my life. At that period I was exceedingly feeble, which I attributed to the sedentary habits of my occupation, but which my friends and my physicians believed to be the result of disease of the lungs. I had, however, no apprehensions that dampened in the least the ardor and confidence with which I entered upon my new ambition, which I pursued with enthusiasm and unalloyed satisfaction until my researches brought me into solitudes so remote that

beds and bed chambers with fixed air became matters of impossibility and I was brought to the absolute necessity of sleeping in canoes and hammocks or upon the banks of the rivers, between a couple of buffalo skins, spread upon the grass, and breathing the chilly air of dewy and foggy nights that was circulating around me.

"Then commenced a struggle of no ordinary kind between the fixed determination I had made to accomplish my new ambition and the daily and hourly pains I was suffering and the discouraging weakness daily increasing on me and threatening my ultimate defeat.

"I had been like too many of the world, too tenderly caressed in my infancy and childhood by the over-kindness of an affectionate mother, without cruelty or thoughtfulness enough to compel me to close my mouth in my sleeping hours, and who, through my boyhood, thinking that I was asleep I was doing well enough, allowed me to grow up under the abominable custom of sleeping, much of the time, with the mouth wide open, and which practice I thoughtlessly carried into manhood, with nightmare and snoring and its other results, and at last (as I discovered in time to save my life) to the banks of Missouri, where I was nightly drawing the deadly draughts of cold air, with all its poisonous malaria, through my mouth into my lungs.

"Waking many times during the night and finding myself in this painful condition, and suffering during the succeeding day with pain and inflammation (and sometimes bleeding) of the lungs, I became fully convinced of the danger of the habit and resolved to overcome it, which I eventually did only by sternness of resolution and perseverance, determining through the day to keep my teeth and my lips firmly closed except when it was necessary to open them, and strengthening this determination, as a matter of life or death, at the last moment of consciousness while entering into sleep.

"Under this unyielding determination and the evident relief I began to feel from a partial correction of the habit, I was encouraged to continue in the unrelaxed application of my remedy, until I at length completely conquered an insidious enemy that was nightly attacking me in my helpless position and eventually fast hurrying me to the grave.

"Convinced of the danger I had averted by my own perseverance, and gaining strength for the continuance of my daily fatigues, I renewed my determination to enjoy my natural respiration during my hours of sleep, which I afterwards did, without difficulty, in all latitudes, in the open air, during my subsequent years of exposure in the wilderness, and having since done so to the present time of my life, when I find myself stronger and freer from aches and pains than I was from my boyhood to middle age, and in all respects enjoying better health than I did during that period.

"I mention these facts for the benefit of my fellow-beings, of whom there are tens (and hundreds) of thousands suffering from day to day from the ravages of this insidious enemy that preys upon their lungs in their unconscious moments, who know not the cause of their sufferings and find not the physician who can cure them.

"Finding myself so evidently relieved from the painful and alarming

results of a habit which I recollected to have been brought from my boyhood, I became forcibly struck with the custom I had often observed (and to which I have before alluded) of the Indian women pressing together the lips of their sleeping infants, for which I could not at first imagine the motive, but which was now suggested to me in a manner which I could not misunderstand.

"From the whole amount of observations I have made amongst the two classes of society—added to my own experience, as explained in the foregoing paragraphs—I am compelled to believe and feel authorized to assert that a great proportion of diseases prematurely fatal to human life, as well as mental and physical deformities and destruction of the teeth, are caused by the abuse of the lungs, in the mal-respiration of sleep, and also that the pernicious habit, though contracted in infancy or childhood or manhood, may generally be corrected by a steady and determined perseverance, based upon a conviction of its baneful and fatal results."

There is considerable truth in Captain Catlin's proverb, which he has expressed on the title page of his valuable pamphlet on mouth breathing: "*Shut your mouth and save your life.*"

ARTIFICIAL RESTORATION OF THE FEATURES

When the teeth have been lost by disease, the features become more or less affected, and in some individuals it causes such deformity as to positively destroy the normal appearance of the face. The loss of all the teeth have a decided effect upon the features as the bony process, which holds the teeth in position in the jaws, becomes considerable absorbed, the muscles which are attached to the alveolar ridge become likewise shrunk-en, causing the muscles of other tissues of the face to become physically altered.

These lost parts can be restored to their normal condition greatly by artificial substitutes, so much so, that when the teeth are exposed to view they will be in harmonious relationship to the rest of the face.

By the skilled hand of the prosthetic dentist, artificial teeth can be inserted artistically, according to the type of the person, and also restoring the principal function of the teeth, namely, mastication.

Artificial teeth should be constructed so that perfect adaptation of speech and mastication are maintained and should be inserted to meet the requirements of age, facial expression, etc. With this object in view, the teeth can be inserted so as to have a natural and pleasing effect; however, there are thousands of artificial teeth inserted where the artistic and natural appearance have been ignored.

The late Dr. James W. White, of Philadelphia, in an excellent contribution to the literature of dental art, said: "No matter how anatomically correct, or how skilfully adapted for speech and mastication, an artificial denture may be, yet, if it bear not the relation demanded by age, temperament, facial contour, etc., it cannot be otherwise than that its artificiality will be apparent to every beholder.

"This law of correlation, harmony, running through nature, attracts and enchants us by an infinite diversity of manifestations: the failure to recognize its demands by art is correspondingly abhorrent to our sensibilities.

"There is a relation between the physical form and the voice, from which we are led to infer in advance the character of the tones which from any given individual may be expected. This law of association, in any case, have led us to expect a bass voice, the anomaly should a falsetto greet us is almost ludicrous.

"There is a similar relation between other physical characteristics and the teeth. A broad, square face, or an oval; a large coarse-featured man or a delicately-organized woman; a miss of eighteen or a matron of fifty; a brunette or a blonde—these and other varieties present as many different types with teeth, in size, shape, color, density, etc., corresponding. If, then, the teeth correlated in their characteristics to those which nature assigns to one class be inserted in the mouth of one whose physical organization demands a different order, the effect cannot be otherwise than displeasing to the eye, whether the observer be skilled in perception, or intuitively recognized harmony without understanding the cause."

Thus, it will be readily understood that the teeth form a very important part in the emotional expressions of the face, possessing as man does the faculty of the ludicrous or the comic, he has developed the power of smiling or laughing, much unlike the lower type of man, or animals, that do not have the faculty to create a smile.

THE MOUTH AND THE TEETH AS FACTORS IN PUBLIC HEALTH*

BY JOHN WORTHINGTON DOWD, LL.D., TOLEDO, O.
(EX-SUPERINTENDENT OF PUBLIC SCHOOLS.)

Six hundred thousand people die annually in the United States that ought not to die. One hundred and seventy-five thousand of these die from tuberculosis.

In the great Civil War that raged for four years between the States, the total number of killed and the number who died from wounds in battle was one hundred and eighty-seven thousand. Practically as many die in the United States in one year from consumption as was killed by battle on both sides in the Civil War.

We had it stated recently, and I believe on good authority, that three million and a quarter babies in the civilized world die annually.

One dies every ten minutes. Babies that ought not to die. Senator Cwen, of Oklahoma, made a speech in the United States Senate recounting these facts, and advocated the establishment of a Department of Public Health. His speech seemed to fall on unappreciative ears.

Why? Because they were discussing in the Senate of the United States the preservation of the physical resources of the nation, the coal lands, the timber lands and the water power sites, and they were trying to make out that Secretary Ballinger was the agent of the trusts and allowed some lands to be entered that ought not to be entered.

While they were discussing the mere loss that would accrue to the nation from these resources—from Senator Owen's estimate there would be annually an economical loss of two billions of dollars—while some lands might have been stolen, three million people were sick, while some coal lands might have been exploited, one million were sick enough to have the attention of the physician and nurse, while some thefts are made six hundred thousand die annually that ought not to die, and as I said one hundred and eighty-seven thousand from tuberculosis. I have faith to believe that in the United States there is a time coming when men and women will be considered the best possession that the United States has, and more atten-

*Lecture delivered before the Ontario Dental Society, Nov. 22, 1910. Published by courtesy of the Author.—ED.

tion will be paid to raising good men and women than to the preservation of the physical resource of the nation. (Applause.)

Secretary Hurty, of the Board of Health of Indiana, tells this story as a sort of parable: "A woman in Indiana was threatened with tuberculosis; she wrote to the department at Washington, asking if they could give her information as to the best methods of preventing tuberculosis.

"They replied they had no information to give her—there was no Department of Public Health.

"A neighbor of hers who had some pigs wrote that his hogs were threatened with cholera—could the Department of Agriculture give him any information? Yes. They sent back word giving exact information as to how to treat the herd of swine for hog cholera; and none of the swine died. They were all saved—but the woman died inside of a year." The moral of that story is, in the United States, that if you want the government to pay any attention to you, be a hog. (Applause.)

Now, let us look for a while at this chart. Two schools in your city, one where the children of the foreign people meet, and one for your home people. Take the physical condition. Take the children first: In 48 per cent. of the children the physical condition is not good in one school, 22 per cent. in the other. Now just look down two lines below and I think you will find the reason the physical condition is not good. Fifty-one per cent. unable to masticate in one school, 20 per cent. in the other, corresponding very nearly to the number whose physical condition was not good. In order to have a good physical condition you must have good mastication, good insalivation, good digestion, good nutrition, then comes good citizenship. I think you will find the anarchists are largely people who have not good mastication, good digestion or good nutrition. Everything goes to the bad in that sort of citizenship. You want good citizens and the best way to have good citizens is to have healthy citizens.

Take a schoolroom like that. The dental surface in the ordinary mouth is from 22 to 24 square inches, not taking into consideration the tongue or tonsils, and they are often the seat of diseases just as much as the teeth. Suppose they are uncared for, as they are in a number of cases there. Multiply 22 by 40 and you get 880 square inches. That is, as I remember, about 6 square feet. Suppose 8 per cent. of it is taken care of—that

leaves 5 square feet of unclean surface in every schoolroom. It means for the pupils that have those unclean mouths there are gelatinous plaques, putrescent pulps, decayed food in the interstices between the teeth. They are breathing everywhere, coughing everywhere, expectorating nearly everywhere, and disease is developed among the men and women in the world. It is a wonder we have healthy children at all, and if the human body did not possess great resisting power we would not have. If there would be that five square feet of unclean space in a school room visible to the naked eye, there would be a panic—the health officer would be notified and also Inspector Hughes. I remember one time Inspector Hughes and I worked for three days to trace down an odor, and after three days' search we found a tobacco box with some decaying grapes in it. The school was dismissed for that. I presume at that time in that schoolroom there were five or six square feet of unclean surface in the mouths of the children. We want to learn to look in the right place. I said to-day to the teachers, and I believe it is true, that those people that are going about with unclean mouths throw out disease-breeding germs all the time, dangerous to the health of the community, and cause more deaths in the community than would a man shooting from a darkened window on Yonge Street into the moving crowd. If he were to do that, you would arrest him and put him in prison. But, because these things are not seen, we learn to bear with them. The children wash their faces, the outside of their faces, but they have never been taught to keep the inside clean. In our school houses that are clean from top to bottom, we pay great attention to sanitary science, we have sanitary appliances of the very latest manufacture. We make clean the outside of the cup and plate, but inside there is rottenness of dead men's bones—dead bone if not bones. Take diseased glands: 47 per cent. with diseased glands. Do you know that the German physicians in conducting investigations have come to the conclusion that a decayed tooth is a better means for bacterial invasion or the invasion of tuberculosis into the body through the esophagus or through the wind pipe; the germ gets into the decayed tooth, it extends to the alveolar tissue, it goes from there into the cervical glands, and the German physicians say about eighty per cent. of these glandular affections are tubercular. That is a pretty startling statement, but in the journal of the American

Medical Association in the last year those two articles from which I give this authority were given. Something ought



"LINKING UP SCHOOL AND HOME."

The past year has been a great advance in the supervision of the children's physical welfare throughout the public schools. Medical and Dental and school nursing are a part of the "extension work," the large sphere of activity now seen to be needed in education. Care of the teeth is a prime importance for the child's health. The picture shows a test clinic as conducted last fall in two down-town schools by the Toronto Dental Society.—*G. P. BRYCE.*

to be done. It is one thing to know that evil exists. Such an evil as this is a great evil. I was over in Saginaw, Michigan, in March, and I talked for three days to the pupils of the public schools and to the public, and after I was there the dentists of Saginaw asked permission of the board and made a dental inspection and they found that ninety-nine per cent. of the pupils of Saginaw were demanding dental attention. Take the army. Why, as I said this afternoon, in the American army in one year one thousand men were rejected on account of defective teeth, and in the British army five thousand men. You know defective teeth cannot make forced marches nor fight brave battles. We use over in our country as an illustration of what good teeth will do our celebrated Theodore Roosevelt. You have seen his pictures, you know what magnificent teeth he has

(laughter), and we say over there that his abounding energy is due to his vitality that comes from his nutrition, that comes from his digestion, that comes from his ensalivation, that comes from his mastication with those splendid teeth, that are a terrior to the lions and rhinos of Africa and to the bulls and bears of Wall Street. I will say this, wherever you find any man or woman with rather extraordinary physical power, with well-developed energy, you will find a good digestion, you will usually find it connected at the upper end with a good set of teeth.

When I was a boy things used to get wrong with the stomach and the caecum and ileum; all the trouble used to be down there, and we doctored for what was inside there; but lately we have come to the conclusion that we have been doctoring in the wrong place, and I think it is Horace Fletcher who says that if proper attention is paid to the three inches of alimentary canal where there is voluntary digestion, where we can get at it, where we can clean it, if we take care of the oral intake, if we will have good teeth and manage our food properly and send it into the stomach properly prepared, we will never know we have an alimentary canal; if we don't do that we will never know we have anything else: it will give notice it is being abused. I think I am correct in the statement that in many cases of appendicitis an examination of the mouth of the patient afterwards has revealed the same bacteria that caused the trouble in the appendix. The alimentary canal is one and the same beginning to the end and we should learn to take care of it.

Now, there are some things that we can do. We can sound the alarm and let the people know where there is danger. There are some things upon which we can educate the people. We can educate the people how to take care of the teeth, and in the campaign in which I am engaged, in which I really have great interest, because I feel it is a great campaign—it is a campaign, Mr. Chairman, that has for its object the bringing about of such a condition of affairs that every child born into the world shall have a fair chance, barring accidents, to live to its threescore years and ten, and if by reason of strength there should be four-score, that added ten years will not be labor and sorrow, but delightful years of mellow autumnal fruitfulness. The place to begin is with the infant. The infant is the potential wealth of the nation. We ought not to let them die. In New York last year 125,000 were born and 15,000 died.

A farmer who would not take any better care of his stock than that would be arrested for cruelty to animals, and very properly so. Longfellow says: "There is a reaper whose name is death." My wife said to me the other day that ought to read: "There is a reaper whose name is breath." It is breath, bad breath, that kills the babies. The baby should be taken care of. I told you the number that died. Statistics deal only with the dead. We don't know how many of the living live lives of less physical power than they ought because they were neglected in childhood. Do you know the teeth are all in the infant's mouth, the twenty milk teeth, the thirty-two permanent teeth are all there when the child is born; they don't come in, they don't grow in, they are there in the new-born babe. It is our business to stand between death and the cradle; it is our business to see that that child's jaw has just as good a chance of development as his brain. It is our business to so regulate affairs that those twenty milk teeth may come to maturity and do their work, and to evolve from the twenty, permanent teeth, sound, regular, beautiful.

There is no need for these ugly, deformed jaws you see in the world, and so one thing I should preach, that we should all preach, should be the preservation of the milk teeth until they have done their work.

Another thing is this, I had some friends say to me when I began this work, "What do you know about teeth?" I said, "I don't know much, but what do you know?" They knew a good many things. I said: "Can you tell me how many milk teeth a child should have in its mouth?" And do you know, I have ordinary intelligent friends and I have not yet found one that knew how many. The fact is, it has just as many as it has fingers and toes—twenty. The milk teeth are furnished in the full set at about three years of age. The next tooth that comes is the sixth-year molar. It has those in each jaw, both sides, above and below, four of them, but that is mistaken by a good many parents as a milk tooth. It is the first permanent tooth, and it should stay with the child as long as it lives if it is taken care of, and it does more to give regularity and beauty and strength to the arch than any other tooth in the jaw, and yet it is mistaken by many parents and allowed to be pulled out. There is a crime in law called mayhem—it means depriving the body of any member necessary for its defence, and I say, whoever pulls the sixth-year molar unnecessarily from the mouth of any child

is committing the crime of mayhem against that child and should be punished accordingly. (Applause.)

Another slogan I sound, and I would have it sounded so loud and clear that every ear in the United States and Canada should hear, is that a clean tooth never decays. You know filth and decay go together—they are twins. I would do that with the same persistence that old Cato used to sound his slogan. You remember Cato was the old Roman who learned Greek at eighty, and when asked why his statue was not among the other statues in the Roman forum, said: "I would rather have the question asked why it is not there than why it is there." He went over to Carthage when Carthage was in its glory and power, and he came back to Rome fearful of Roman prestige, and so on whatever subject he talked, on whatever topic, in whatever place, to whatever kind of audience, he concluded his speech always with "Carthage must be destroyed," and so I would conclude every speech I make—I would have as a thread running through all I say, "A clean tooth never decays." That may not be exactly true. Perhaps there are some physical conditions, some diseased conditions in which teeth do decay that are kept comparatively clean, but it is general enough to be given as a general truth, the thing that causes the destruction of teeth is filth.

I hardly know, Mr. Chairman, when to stop when I get started on this subject. We are learning what causes diseases. We are learning that disease is not sent on us on account of our sins for our affliction. I think instead of saying when a child dies, "The Lord gives, and the Lord has taken away, blessed be the name of the Lord," there should be an inquest held to determine who is or what is the cause of the death of this child, this boy or girl, this man or this woman. The God who made man knew how to make him, and he made him to live threescore years and ten. If he doesn't live that time somebody is at fault. We have inquests only in case of what is termed accident, when we really know what causes the death. (Laughter.)

I was glad to see on the bill-board to-night that there is a movement on foot to determine the cause or the means of infection of the officers of the Queen's Own Regiment with typhoid fever. It should be found out. When the great water supply of the city is contaminated with the typhoid bacillus, I say to you it is murder in the first degree, and whoever is responsible for it should be made to suffer for it. (Applause.) A girl out

in Kansas went to her physician with a sore on her lip and asked the physician the cause, and the physician told her that she had syphilis. She was horrified. Some smart men here say we know about that. But you don't know. They traced the cause, they traced the source to a public drinking cup. Kansas got busy. You can't find it in the schools, hotels or railway trains. There used to be a coarse joke when I was a boy about the man who went to the hotel and inquired for the hotel tooth brush. The man who drinks from the hotel drinking cup or



View of part of an audience of 2000 school children of St. Thomas, Ontario, in attendance at one of Prof. Dowd's lectures on Dental Hygiene.

from the public drinking cup is committing the same unsanitary sin that the man would be who used the hotel tooth brush. In fact, worse, because the tooth brush might be exposed to the rays of the sun, which is in some measure a germicide, while in the moisture of the drinking cup are kept alive the deleterious bacteria with which it is found to be infected. You know there are about twenty germs in the world if gotten rid of we would have a healthy world; death would come not as a robber, but only as a consoler; the wearied body would at last go peacefully back to the friendly dust—its native home. We can do much to bring about that time. The great White Plague has done more to depopulate the earth than all the wars and pestilences and all the famines; it is a pestilence in itself. I was reading in one of your papers that one person in Toronto died every day from tuberculosis; ten persons in this Province die every day from tuberculosis.

In Cleveland, at the opening of the Oral Hygienic campaign last spring, the leading papers said 11,000 people were suffering

in Cleveland from tuberculosis. I suppose about the same are suffering in Toronto. Tuberculosis plays no favorites; it enters the cottage of the lowly, the mansion of the rich, and the palace of the noble, and wherever it goes it goes to kill. Sometimes it does its work quickly and some times slowly, but it counts in the statistics of the dead.

You remember reading in your Bible that, when the Lord hardened Pharaoh's heart and He would not let the people go, that among the plagues that afflicted the Egyptians was the death of the first-born, and the same book goes on to say, "And there was not one house in which there was not one dead." How like the plague of tuberculosis that is!

The Israelites saved their first-born because they sprinkled the door-posts and the lintels with the blood of the sacrificial lamb. But, unfortunately, there is no sprinkling of blood on the lintels and door-posts of our homes, which will cause the dead angel of tuberculosis to spare and pass on. There is only one remedy: Cleanliness, cleanliness, cleanliness. The Israelites celebrate the Feast of the Passover to this day. I would like to see a feast of cleanliness inaugurated in the world: the world cleaned up and made a fit place to live in; and I would like to know that in some future day there would be a celebration among the people, an annual celebration of this feast of cleanliness, to call to mind the time when the people in this ancient time got together and concluded to clean the world, clean out the malevolent bacteria, and make the world a fit place to live in? You can do it if you will. The time is coming when every prison and hospital and reformatory institution will have its dental department; attention will be paid to the teeth as elements of good citizenship. I know that every School Board should have its dental member. Medical and dental inspection of our schools is coming, but you know, as a necessary corollary to mental education is brain with health. If you allow the one at the public expense, you must allow the other, because it is folly to educate the mind of the people in bodies that are unable properly to wield the mind. Let us make a strong body to go with the educated mind and then we will see things done in the world. The time for dental and medical inspection in our schools is at hand. It may come in places as it has in Boston. Mr. Forsyth has devoted \$2,000,000 for a building and for dentists to see that the children of Boston, up to sixteen years of age, have their

teeth cared for. A man in London, Eng., has given \$1,000,000 to give dental attention at first cost to the poor of London. I look for a good deal from Ontario. As an educationist, I know something of Ontario. I know that a system of education from the kindergarten to the university has been a model and an inspiration to all the states of the United States. There has not been a state in the United States that has a better system, if as good. I have faith to believe that, when the people of Ontario know the need for action, as shown in that chart, and as shown in the hundreds of other charts in your Province, that the Department of Education will get busy and do something. Dentists are rather modest. They should not be; they are a noble profession and I want to say that, of all the forces arrayed in the defence of health and strength and beauty of the race, the dentist is easily in the front rank, for he stands at the gateway with the sword of exact physical and sanitary science, to strike off, or strike down and ward off the malignant destroyers that would enter the citadel of human life. I thank you.



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